ABSTRACT

A shaped charge and a method of using such to provide for large and effective perforations in oil bearing sandy formations while causing minimal disturbance to the formation porosity is described. This shaped charge uses a low-density liner having a filler material that is enclosed by outer walls made, preferably, of plastic or polyester. The filler material is preferably a powdered metal or a granulated substance, which is left largely unconsolidated. The preferred filler material is aluminum powder, or aluminum particles, that are coated with an oxidizing substance, such as TEFLON®, permitting a secondary detonation reaction inside the formation following jet penetration. The filled liner is also provided with a metal cap to aid penetration of the gun scallops, the surrounding borehole casing and the cement sheath. The metal cap forms the leading portion of the jet, during detonation. The remaining portion of the jet is formed from the low-density filler material, thereby resulting in a more particulated jet. The jet results in less compression around the perforation tunnel and less skin damage to the proximal end of the perforation tunnel.